Sustainable development and heritage conservation have become guiding principles for our modern industrial society. With increased awareness of the importance of economic, social and environmental sustainability, expertise in sustainable green building design and heritage conservation is now in high demand. Graduates in architectural conservation and sustainability apply their knowledge in sustainability to the design and retrofit of both new and existing buildings, considering areas such as life-cycle costs, impacts of selected materials, and energy needs and consumption. They also bring their expertise to the burgeoning field of conservation, as more buildings receive various levels of heritage designation and are in need of repair and adaptation.

The Carleton advantage
Carleton’s Bachelor of Engineering (BEng) in Architectural Conservation and Sustainability Engineering is a multidisciplinary program that blends engineering and architectural studies. You will study within a top-notch engineering Faculty and be enriched by the program’s close association with Carleton’s well-known architecture program. The BEng in Architectural Conservation and Sustainability Engineering offers:

- the opportunity to follow one of two study streams suited to your background and interests;
- a challenging final-year project that brings together knowledge, skills and expertise gained in the program;
- integrated and collaborative approaches to projects with architecture students;
- generous scholarships to high-standing applicants.

In addition, Carleton offers all the benefits of studying in the nation’s capital, including the university’s proximity to key industry and government partners, such as the Heritage Conservation Directorate, Public Works and Government Services Canada (PWGSC), the Canada Green Building Council, and Canada Mortgage and Housing Corporation.

Our laboratory and research facilities
At Carleton, you will benefit from:

- a wealth of well-equipped engineering laboratories and computer rooms on campus;
- the excellent resources of Carleton’s state-of-the-art architecture facilities, considered among the finest in North America;
- our proximity to, and association with, the National Research Council Canada, Natural Resources Canada and Environment Canada.

Your co-op opportunities
As a student in the Architectural Conservation and Sustainability Engineering program you will have the opportunity to apply to the Co-operative Education Program. Co-op integrates degree-related, paid work terms into your degree program. A minimum of four work terms are required to obtain the Co-op designation on your degree. Often, the four consecutive work terms following third year take place with the same employer. Our program is closely associated with government departments and agencies as well as private firms, giving students valuable work experience and contacts that will benefit them in the future. The pattern of work and study terms for the co-op option is shown in the following table.

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>study term 1</td>
<td>study term 2</td>
<td></td>
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<tr>
<td>2</td>
<td>study term 3</td>
<td>study term 4</td>
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<td>study term 5</td>
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<td>work term</td>
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<tr>
<td>4</td>
<td>work term</td>
<td>work term</td>
<td>work term</td>
</tr>
<tr>
<td>5</td>
<td>study term 7</td>
<td>study term 8</td>
<td></td>
</tr>
</tbody>
</table>
Choosing the right program

The BEng in Architectural Conservation and Sustainability Engineering is fully accredited by the Canadian Engineering Accreditation Board. Students in both the structural and environmental streams begin with a similar core of courses in engineering, math, science and introductory architecture. In the third and fourth years of the program, the streams become more specialized. As a structural stream student, you will concentrate on conservation and sustainability in the design of new structures, and the assessment and retrofit of existing structures. The environmental stream allows you to develop sustainable building practices with a focus on water quality and conservation, air quality, life-cycle analysis, and disposal of materials and waste streams. The courses for a typical Architectural Conservation and Sustainability Engineering program are shown below. Courses separated by a slash (/) correspond to the two different streams.

### Study Term 1
- Calculus for Engineering or Physics
- Linear Algebra for Engineering or Science
- Introduction to Engineering
- General Chemistry I
- Introduction to Architecture

### Study Term 2
- Differential Equations and Infinite Series for Engineering or Physics
- Mechanics I
- Architecture and the Environment
- General Chemistry II
- History of Structures
- Introductory Electromagnetic Wave Motion

### Study Term 3
- Multivariable Calculus for Engineers or Physics
- Thermodynamics and Heat Transfer
- Mechanics of Solids I
- Civil Engineering Materials
- Architectural Technology 3
- Problem Solving and Computers

### Study Term 4
- Process Analysis for Environmental Engineering
- Fluid Mechanics I
- Introduction to Statistical Modeling I
- Numerical Methods
- Heritage Conservation in Canada
- Communication Skills for Engineering Students

### Study Term 5
- Introduction to Structural Analysis/Systems Modeling
- Introduction to Structural Design
- Architectural Technology 4
- Design Economics
- Architectural Conservation, Philosophy & Ethics

### Study Term 6
- Mechanics of Solids II/Water Treatment
- Design of Structural Steel Components/Contaminant & Pollutant Transport
- Design of Reinforced Concrete Components/Municipal Hydraulics
- Historic Site Recording and Assessment
- Wood Engineering/Microbiology

### Study Term 7
- Design Project
- Recycling Architecture in Canada and Abroad
- Indoor Environmental Quality
- Civil Eng elective/Wastewater Treatment
- Civil Eng elective/Waste Management
- Civil Eng elective/Engineering elective

### Study Term 8
- Design Project (continued)
- Professional Practice
- Green Building Design
- Building Pathology and Rehabilitation
- Civil Eng elective/Planning Impact Assessment

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Your future opportunities

As a graduate in this field, you will have acquired a skill set that industry has identified as lacking in current post-secondary school education in Canada. Graduates from the Structural Stream will be to design a building just like a structural or civil engineer and will benefit from specific expertise in green building design and heritage conservation. Graduates from the Environmental Stream have a unique blend of expertise in water and air quality, waste and resource management complemented by sustainable building design and conservation.

### Admission requirements

For admission to the Architectural Conservation and Sustainability Engineering program, you must have an Ontario Secondary School Diploma (OSSD) or equivalent, including a minimum of six 4U/M courses. Your six courses must include four prerequisite courses:

- Advanced Functions
- Chemistry
- Physics
- one of:
  - Calculus and Vectors*
  - Biology
  - Earth and Space Science

* Strongly recommended for applicants to all engineering programs.

Although it is not an admission requirement, at least one 4U course in either English or French is recommended. Equivalent courses may be substituted at the appropriate 4U level.

If you are from outside Ontario, or outside Canada, see Carleton University’s website at admissions.carleton.ca/apply for your specific program requirements.

Since the number of qualified applicants may be greater than the number of available spaces, cut-off averages and required marks may vary.

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For more information

Please visit carleton.ca/cee or consult the Carleton University Undergraduate Calendar at calendar.carleton.ca/undergrad.